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09/580,179	05/26/2000	Dominique Commereuc	PET-1845	8780

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EXAMINER

PASTERCZYK, JAMES W

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Paper No. 15

Application Number: 09/580,179
Filing Date: May 26, 2000
Appellant(s): COMMEREUC ET AL.

Harry B. Shubin, Esq.
For Appellant

EXAMINER'S ANSWER

MAILED

DEC 16 2003

GROUP 1700

This is in response to the appeal brief filed 10/30/03.

(1) *Real Party in Interest*

A statement identifying the real party in interest is contained in the brief.

(2) *Related Appeals and Interferences*

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) *Status of Claims*

The statement of the status of the claims contained in the brief is correct.

(4) *Status of Amendments After Final*

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) *Summary of Invention*

The summary of invention contained in the brief is deficient because although independent claim 21 recites the presence of a Bronsted acid in the composition, independent claim 1 requires it be an organic Bronsted acid. In addition, claim 21 merely recites "preconditioning" without specifying time or temperature, while claim 1 recites the time and temperature range of preconditioning. These parameters are found in the specification.

(6) *Issues*

The appellant's statement of the issues in the brief is correct.

(7) *Grouping of Claims*

The appellant's statement in the brief that certain claims do not stand or fall together is not agreed with because appellants do not argue their asserted groupings separately.

(8) *Claims Appealed*

The copy of the appealed claims contained in the Appendix to the brief is correct.

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(9) Prior Art of Record

4,283,305 CHAUVIN et al. (Chauvin II) 8/1981

5,059,571 CHAUVIN et al. (Chauvin I) 10/1991

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1, 3-11, and 17-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chauvin II in view of Chauvin I.

The present invention can be summarized as a catalyst composition comprising the reaction product of a nickel bis(acetate) compound, at least one aluminum hydrocarbyl dihalide compound, and at least one Bronsted acid, which may be an organic acid, for example and preferably trifluoroacetic acid, all of which are reacted together in a solvent for some period of time at some temperature. Preferably the time is 1 minute to 5 hours and the temperature is 0-80°C. The independent claims are 1 and 21, claim 1 reciting the particular time and temperature parameters as well as use of the organic acid, claim 21 being broader in that the acid need not be organic and the reaction among the reagents is referred to as "preconditioning", a term defined in the specification at p. 3, l. 14-23 as mixing the three required reagents in preferably the mixtures obtained in the oligomerization reaction for which the catalyst is prepared for the time and temperature noted above. Thus if the catalyst is to be used to dimerize propylene, isohexene is a preferred solvent since this is the product of dimerizing propylene.

The issue is whether the prior art would have taught one of ordinary skill in the art to mix the three reagents together for any particular time or at any particular temperature before use as a

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catalyst. It is the examiner's contention that such a step would have been obvious to one of ordinary skill in the art at the time the invention was made.

The examiner first notes that both references and the present application are subject to assignment to the same assignee, and that Mme. Commereuc is a common inventor in all three cases. In addition, there is further overlap in inventors among these three cases, and the present application was filed approximately 19 years after the issue date of the primary reference.

Chauvin II discloses the three required reagents of the present invention (abstract, col. 1, l. 50 to col. 2, l. 55) for use in a catalyst that performs the same olefin oligomerization or dimerization reaction of the present invention (abstract, col. 2, l. 62). This reference also discloses that all three catalyst components may be combined at once before use in olefin oligomerization as applicants claim (col. 3, l. 12-16). Although the use of an inert gas in the preparation of the catalyst is not actually claimed by appellants, one of ordinary skill in the art would have recognized that aluminum hydrocarbyls, halides, and mixed halide/hydrocarbyls are sensitive to both atmospheric moisture and oxygen, ultimately forming aluminum oxide, a very stable material, hydrocarbons, and hydrogen halides, hence the use of an inert atmosphere in the preparation of the catalyst would have preserved the starting materials from reaction with water and oxygen contaminants so that the three required reactants would have been able to react with each other to fullest effect, forming the most active catalyst possible.

Chauvin II further discloses in its examples that all three required reagents are added simultaneously to the reactor in which the reaction to be catalyzed is performed, along with the feedstock for the catalyzed reaction, and that the ensuing reaction is carried out for three days at a temperature of 42 °C. Given that appellants' claimed composition uses open "comprising"

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language to describe the reagents used to make the composition, the presence of solvents and unsaturated hydrocarbon feedstocks is not barred from their compositions. The controlled time and temperature of the prior art reaction certainly would have suggested some sort of “preconditioning” of the catalyst reactants in that it would have been impossible to prevent compounds mixed together in the same vessel from reacting together in some way, and the extra steps of the prior art are not barred, again by appellants’ use of open “comprising” language.

Chauvin I is also addressed to a catalyst used to make olefin dimers and oligomers (col. 1, l. 6-8), with two of the catalyst components, the nickel compound and the aluminum compound, reading on those of the Chauvin II reference as well as the claimed invention (col. 1, l. 42 to col. 2, l. 8). In addition, Chauvin I teaches that the three required reagents for its catalyst may be mixed in any order (col. 2, l. 27-28), although preferably the nickel and epoxy compound are first mixed, followed by addition to the oligomerization reaction medium simultaneously with or before the aluminum compound (col. 2, l. 29-30, l. 34-36). In other words, all three components of the Chauvin I catalyst can be combined simultaneously with addition to “the reaction medium”, a phrase which does not necessarily imply inclusion of the olefin monomers.

From the examples of Chauvin I it is clear that the fastest oligomerization reaction does not begin until all three catalyst components are present (see examples 1 and 2). Hence all three components are necessary to form the most active catalyst, compared to the comparative examples of Chauvin II which show that an active catalyst is made by just the nickel and aluminum compounds, and comparative example 3 of Chauvin I which shows that a catalyst with lower activity is made with only the nickel and aluminum compounds. Hence the third reagent in either reference is not necessary for catalyst activity; it only aids that activity. Of further note

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in Chauvin I is the use of vacuum or argon atmospheres in the preparation of the catalyst (examples 1 and 2 respectively), both of these being unreactive in themselves to the components of the catalyst, especially the aluminum compound without which the catalyst is inactive, and thus preserving the full activity of the catalyst formed by the combination of these components for introduction of the olefin feedstock.

It would have been obvious to one of ordinary skill in the art to apply the teaching of Chauvin I to the disclosure of Chauvin II with a reasonable expectation of obtaining a highly-useful olefin oligomerization catalyst with the expected benefit of the catalyst being more active since it has been able to fully form by allowing its constituent ingredients to react together.

(11) *Response to Argument*

As noted above, the issue is whether it would have been obvious at the time the invention was made to combine all three reagents in a solvent, then allow them to react together for some time at some temperature to form the active catalyst before use as a catalyst, this reaction time being referred to by appellants as "preconditioning".

It is clear from the prior art that it is the combination of the nickel compound with the aluminum compound which forms an active catalyst; the third component in both references merely increases the catalyst activity. As noted above, it is also clear that both references contemplate the combination of all three components at least simultaneously with addition of a feedstock. Inevitably some reaction among the three components would have occurred. One of ordinary skill in the art, wishing a most active catalyst, would have naturally allowed the catalyst components to react together for some time at some temperature in order to allow the active catalyst to form before its use regardless of which third component were added, the epoxy or the

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acid. It is the combination of the nickel compound with the other two compounds, necessarily the aluminum compound, which forms the active catalyst. Driving that reaction between the nickel and aluminum compounds to completion by application of even mild heat at 0°C, the lower end of appellants' temperature range, for some period of time, minimally one minute, the lower end of appellants' time range, would have inevitably formed a more active catalyst than adding all three catalyst components to a solvent which also contained the starting material for the oligomerization reaction; the presence of the olefin starting material as well as separate solvents for each of the three catalyst components would have only diluted the reaction medium and permitted the three catalyst components to engage in side reactions with the olefin before reacting with each other to form the active catalyst. Likewise, driving the reaction among all three catalyst components to completion, even under such mild conditions as would be present at the lower end of appellants' time and temperature range, would have also inevitably formed a more reactive catalyst than simply combining the three catalyst components together in a reactor filled with solvents for each component as well as olefin feedstock.

Appellants argue that the two references are not combinable since they are not analogous art. However, as noted above, both references are addressed to the same problem, i.e. the production of a catalyst which is capable of dimerizing or oligomerizing olefins. Both accomplish the same task with the same two basic ingredients, namely the nickel and aluminum compounds. The addition of either the epoxy or the acid merely boosts the activity of the catalyst. Thus appellants' assertion that these two catalysts are "wholly different" is without merit. As noted above, both references show that the combination of the nickel and aluminum compounds is what makes an active catalyst. Further reaction of these two compounds with

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another additive, be it acid or epoxy, merely increases the catalyst activity. Appellants' assertion that neither reference discloses or teaches the simultaneous addition of all three catalyst components is merely selective reading of the references for what they prefer, not what they actually disclose.

Reactions in solvents inevitably require some time for the reactants to meet each other and react, as well as the energy supplied by some temperature to overcome the thermodynamic barrier to reaction. That the examples of Chauvin II all require the reaction of the three catalyst components with the olefin feedstock for three days at 42°C to achieve the activity observed suggests that deletion of the feedstock should result in a catalyst that does not require nearly so drastic conditions to convert the amount of monomer used in these examples into the amount of product made therein. Chauvin I, using what appears to be a better catalyst accelerant (the epoxy; compare its examples 2, 3 and 4), still requires 10 minutes and 40°C in the presence of the olefin to achieve what it considers to be acceptable activity. It is the production of a fully formed catalyst from its components which is critical to the reactivity of these catalysts.

For the above reasons, it is believed that the rejections should be sustained.

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Respectfully submitted,

JWP

December 3, 2003

Conferees

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